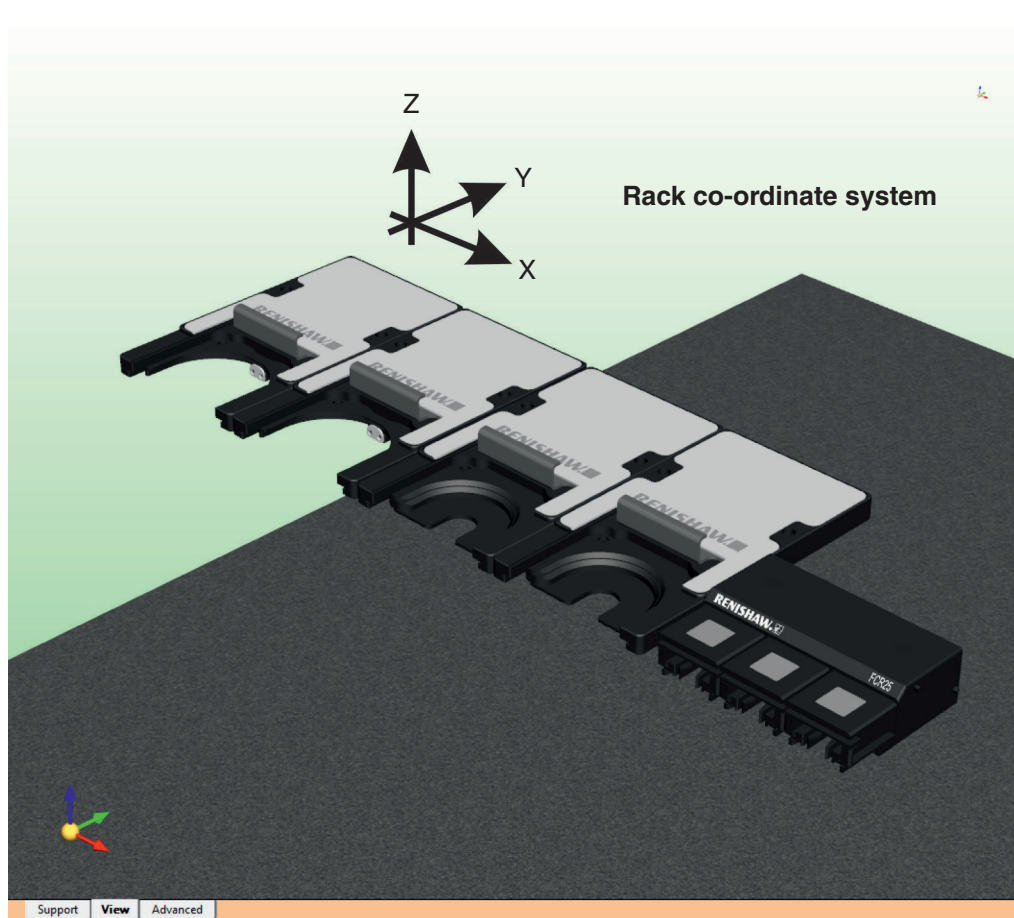


REVO and FCR25 rack creation, location and allocation



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REVO and FCR25 rack creation, location and allocation

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1 REVO and FCR25 rack creation, location and allocation

1.1 Tutorial pre-requisites

- Student must have completed the 'Creating a new environment, tools and calibration of tools' tutorial

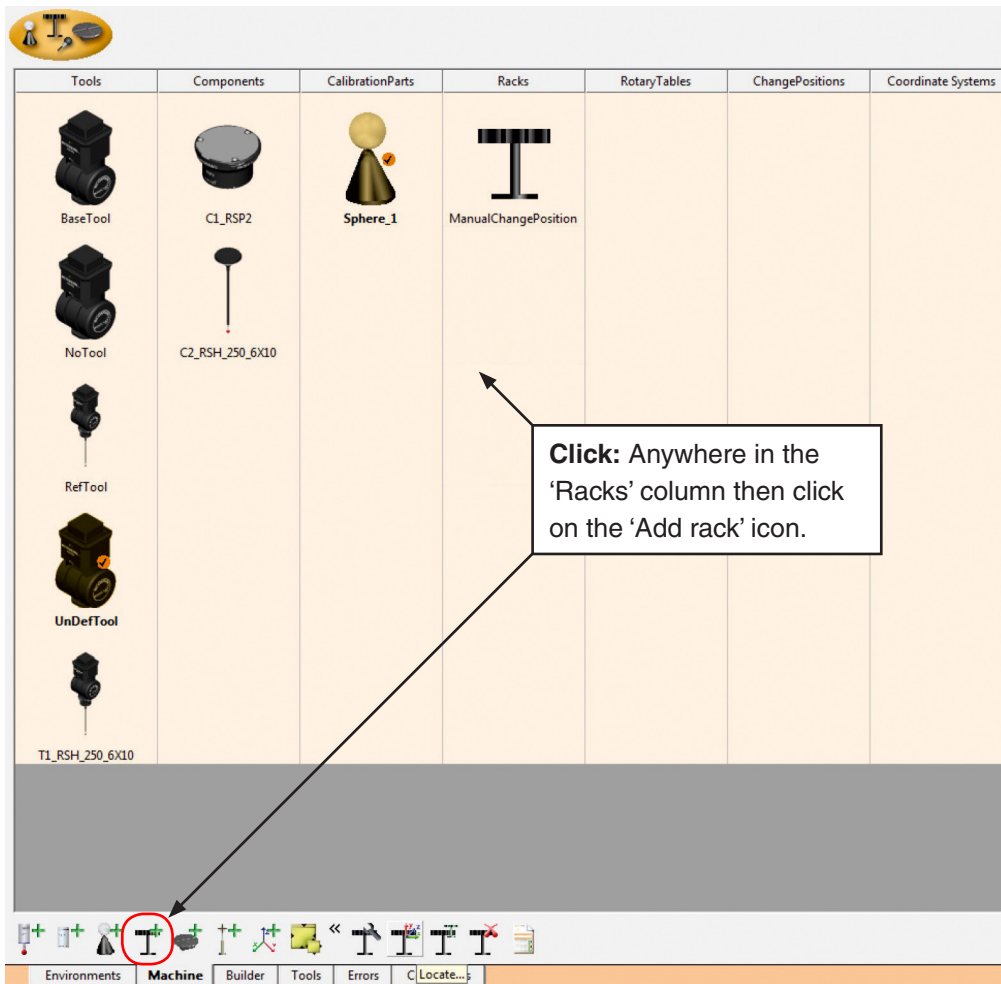
1.2 Tutorial objectives

- Further exposure to Renishaw specific hardware and software interaction
- Introduction to the concept of multiple tool systems, hardware definition and allocation to storage devices
- Consideration of hardware/software interaction and practical location of storage devices within a machine volume

2 Introduction

This tutorial will introduce the student to the Renishaw specific methods of defining, populating and locating storage racks for automated tool change. These methods comply with the I++ standard of CMM interface. UCCserver and this tutorial is for use with any Renishaw or OEM client software.

3 Adding a rack to the system



Add Rack

Name: Rack_1 No. of Ports: 4

Type: Revo Rack is in unlocked position ☐

Location: X: 0.000 Y: 0.000 Z: 0.000 Rack is Located ☐ Locate Rack Ports (Auto Mode Only) ☒

Safe Position: X: 0.000 Y: 0.000 Z: 0.000 Use Safe Line ☐

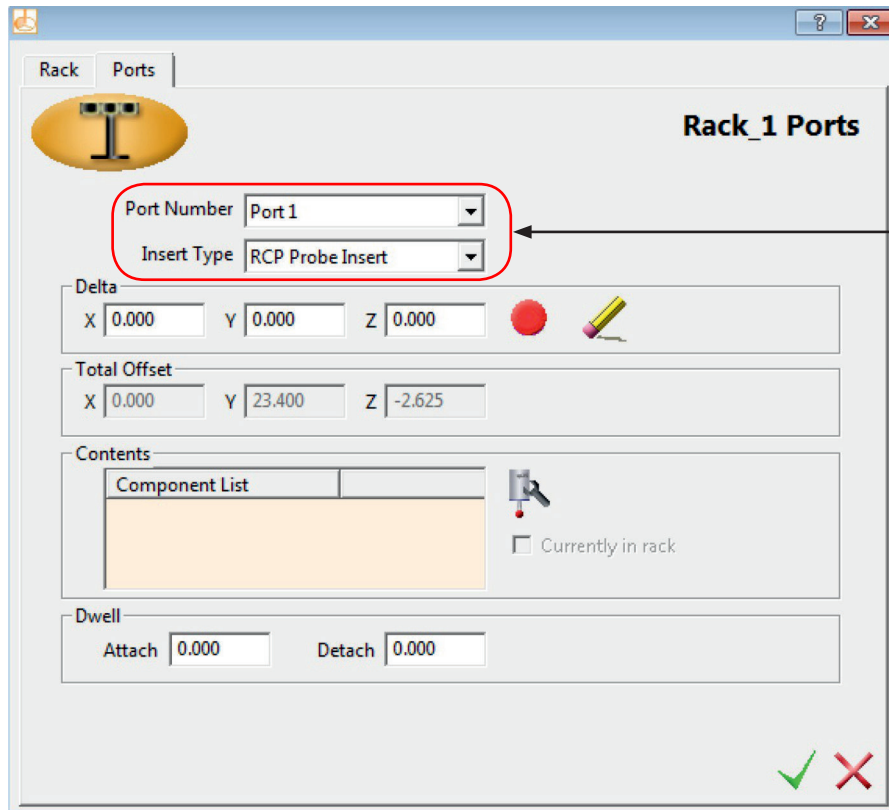
Front Direction: I: 0.000 J: -1.000 K: 0.000

Up Direction: I: 0.000 J: 0.000 K: 1.000

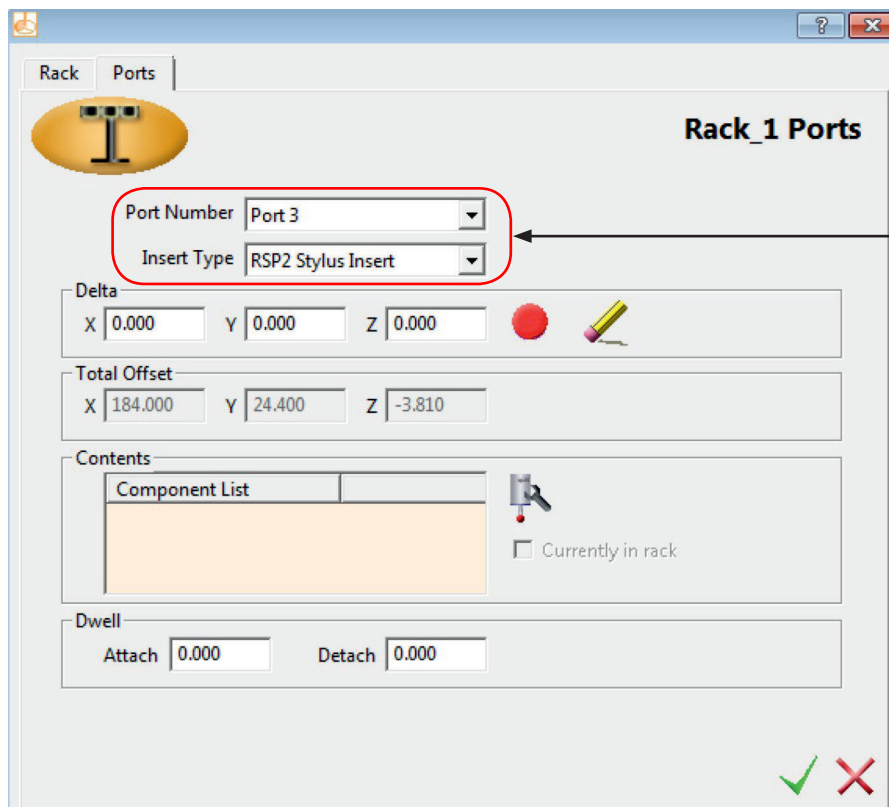
Distances: Attach: 13.000 Check-in: 75.000 Check-out: 75.000

Speeds: Docking: 50.000 Docking acceleration: 50.000 Coupling: 15.000

Next click on the 'Ports' tab. We now need to set-up each port to enable us to continue with the 'Locate' process. With this rack, to suit the components we are going to allocate, we need to have a standard 'RCP probe insert' in ports 1 and 2 and a 'RSP2 stylus insert' in ports 3 and 4.



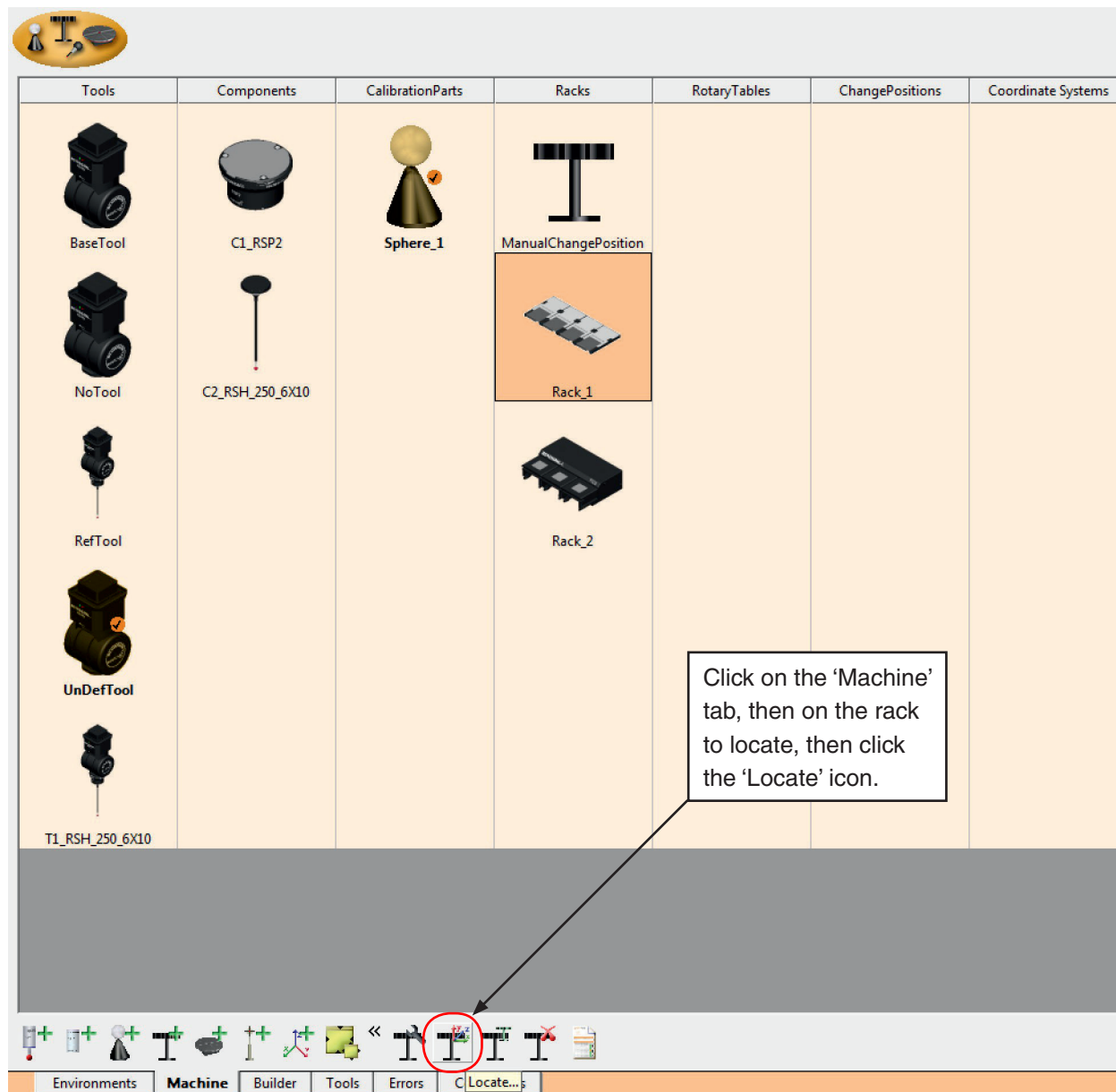
Ports 1 and 2 should be left with the default 'Insert Type' (RCP probe insert).



Ports 3 and 4 should have 'RSP2 stylus insert' selected as the 'Insert Type'.

4 Locating the rack

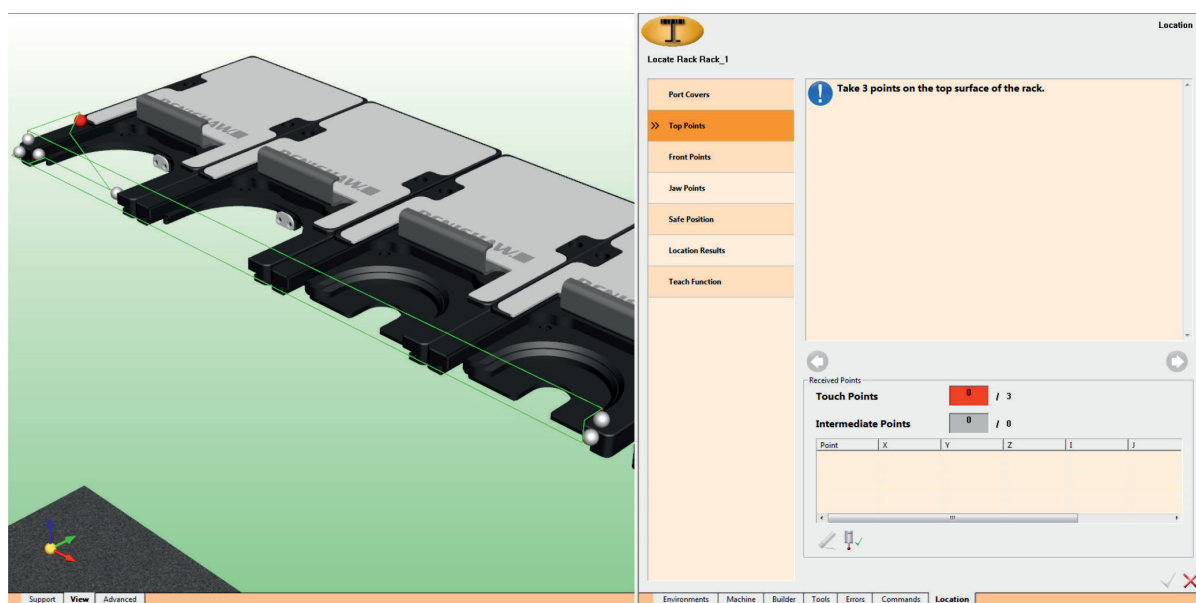
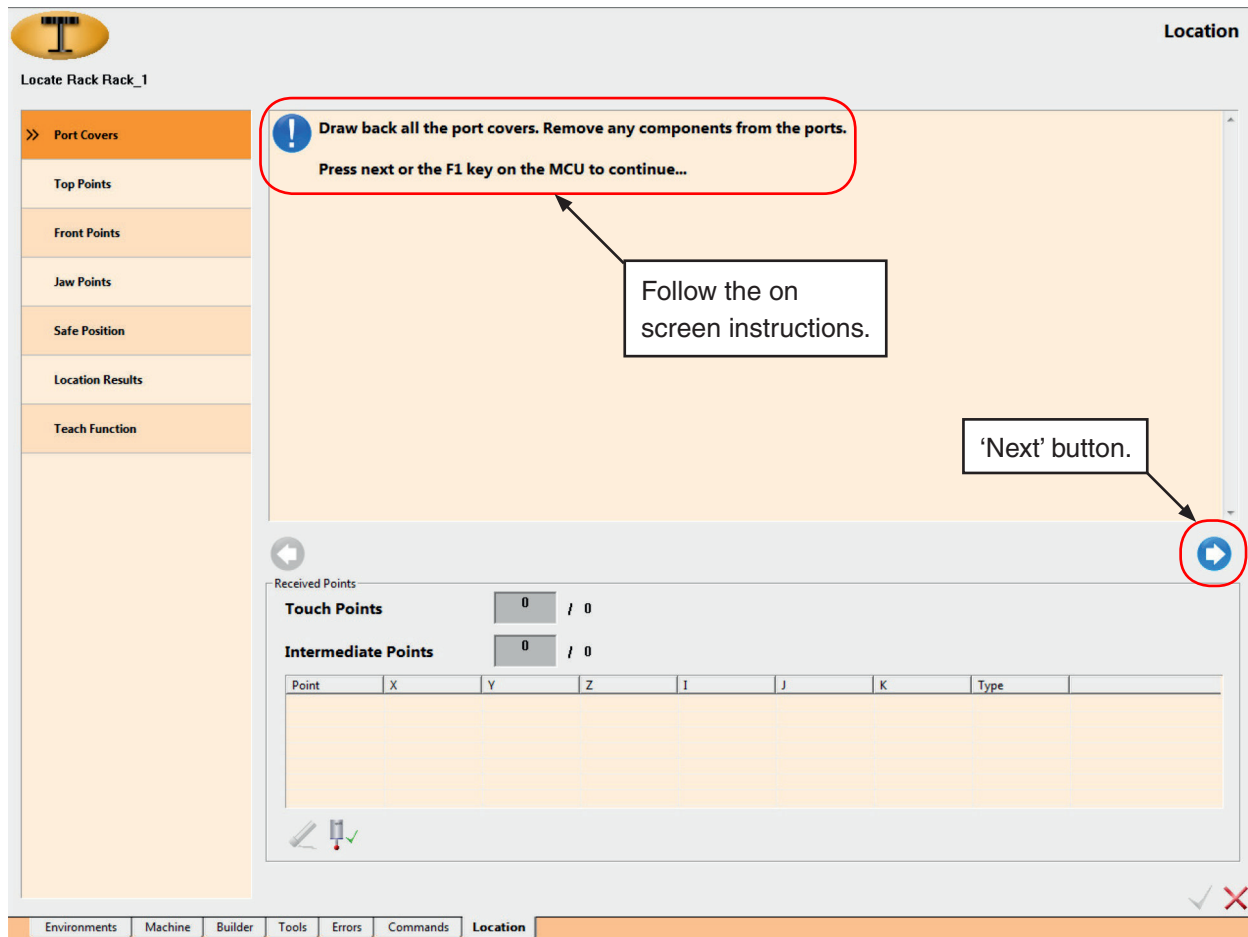
Having set up the rack we can now locate it, the following procedure will explain how to achieve this.



Lock the port covers in the open position prior to commencing the locate procedure.



The following screen will appear at the start of the locate procedure.

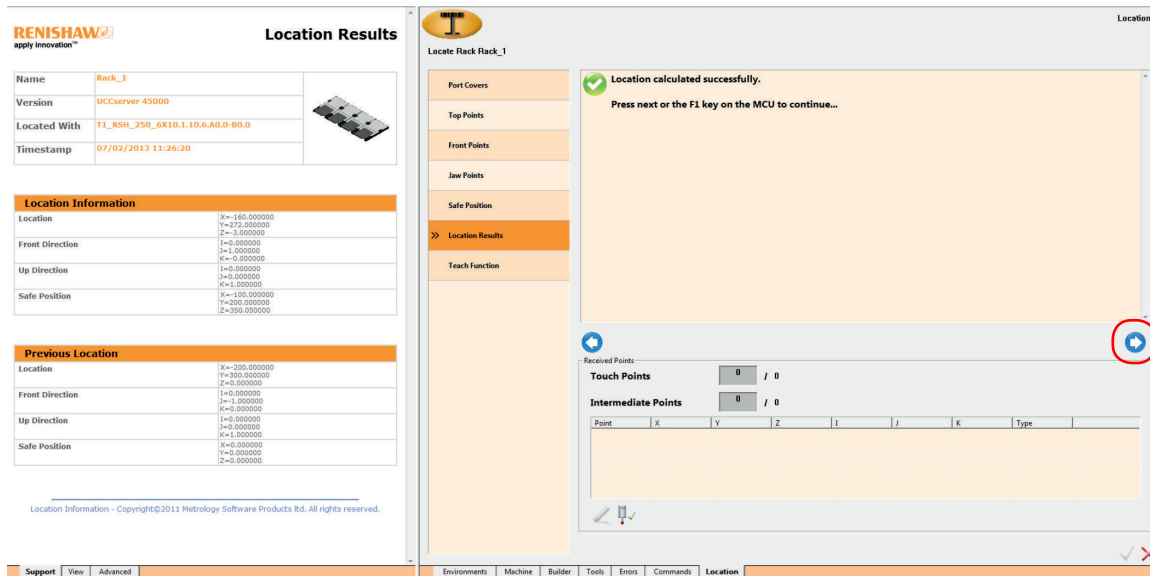


Take points on the rack in the positions indicated on the screen by a flashing red sphere.

Continue to follow the on screen instructions.

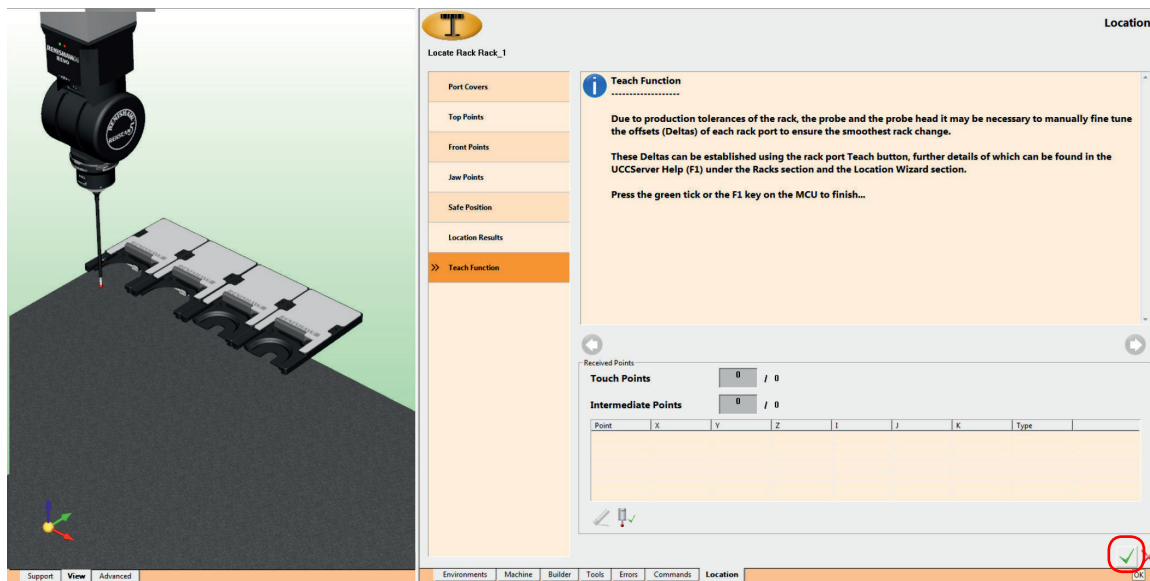
Once the manual locate procedure has been completed the following results screen will be displayed.

Click the 'Next' button to continue.

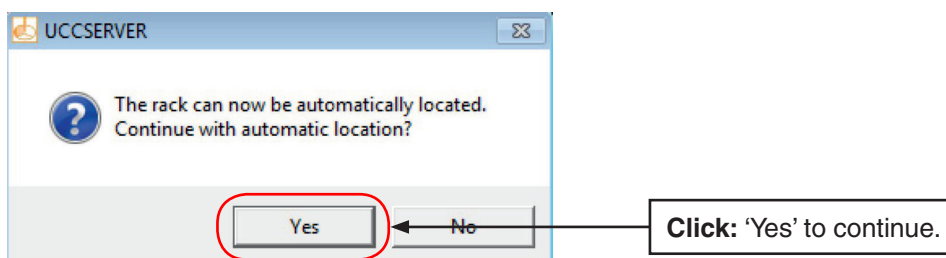


When the next screen is displayed click the 'Green Tick' to finish the procedure.

If further information is required about rack 'Delta' values please refer to UCCserver help (F1).



The following box will now be displayed asking if automatic location should be carried out. This option should always be selected.



When the screen below is displayed click the 'Next' button to continue. Follow the on screen instructions to carry out automatic alignment of the rack.

Locate Rack Rack_1

Port Covers

Top Points

Front Points

Jaw Points

Safe Position

Port Top Points

Port Front Points

Port Jaw Points

Location Results

Draw back all the port covers. Remove any components from the ports.

Press next or the F1 key on the MCU to continue...

Received Points

Touch Points 0 / 0

Intermediate Points 0 / 0

Point	X	Y	Z	I	J	K	Type

Environments Machine Builder Tools Errors Commands **Location**

Once the automatic locate procedure has been completed the following results screen will be displayed.

Click the 'Green Tick' to complete the procedure.

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Location Results

Name: Rack_1

Version: UCCserver 45000

Located With: T1_RSH_250_6X10.1.10.6.A0.0-80.0

Timestamp: 07/02/2013 14:31:25

Location Information

Location: X=-160.000000, Y=272.000000, Z=-3.000000

Front Direction: I=0.000000, J=1.000000, K=-0.000000

Up Direction: I=0.000000, J=0.000000, K=1.000000

Safe Position: X=-160.000000, Y=280.000000, Z=-390.050000

Previous Location

Location: X=-160.000000, Y=272.000000, Z=-3.000000

Front Direction: I=0.000000, J=1.000000, K=-0.000000

Up Direction: I=0.000000, J=0.000000, K=1.000000

Safe Position: X=-160.000000, Y=280.000000, Z=-390.050000

New Port Deltas

Port 1: X=0.000000, Y=0.000000, Z=0.000000

Port 2: X=0.000000, Y=0.000000, Z=0.000000

Location Results

Location calculated successfully.

Press the green tick or the F1 key on the MCU to finish...

Received Points

Touch Points 0 / 0

Intermediate Points 0 / 0

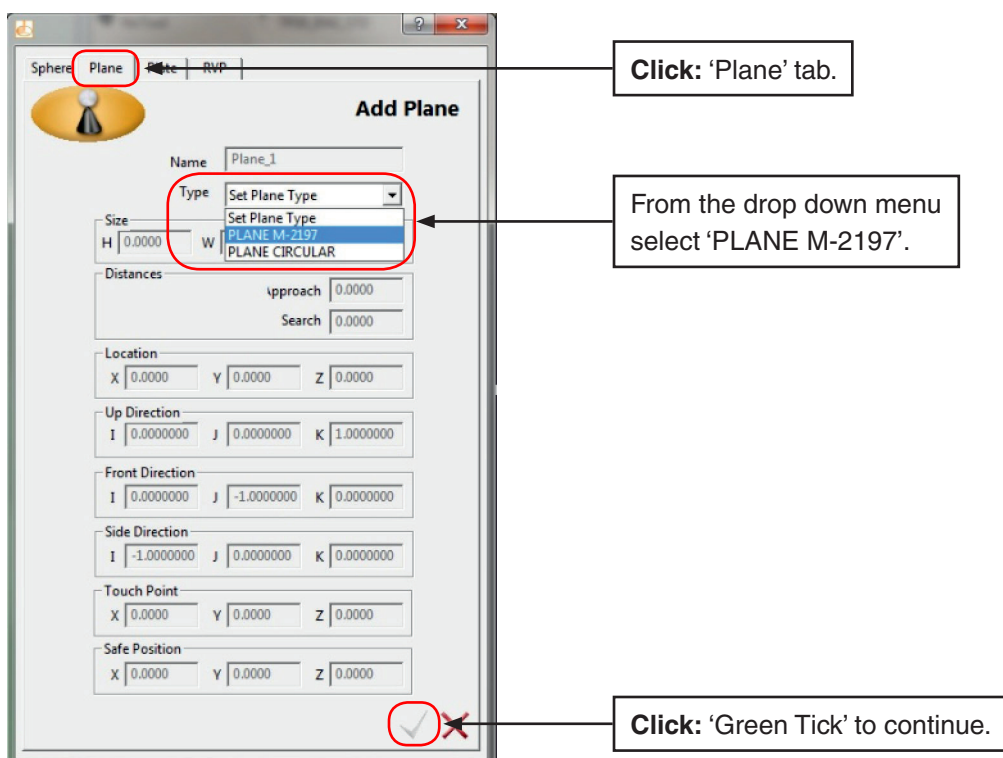
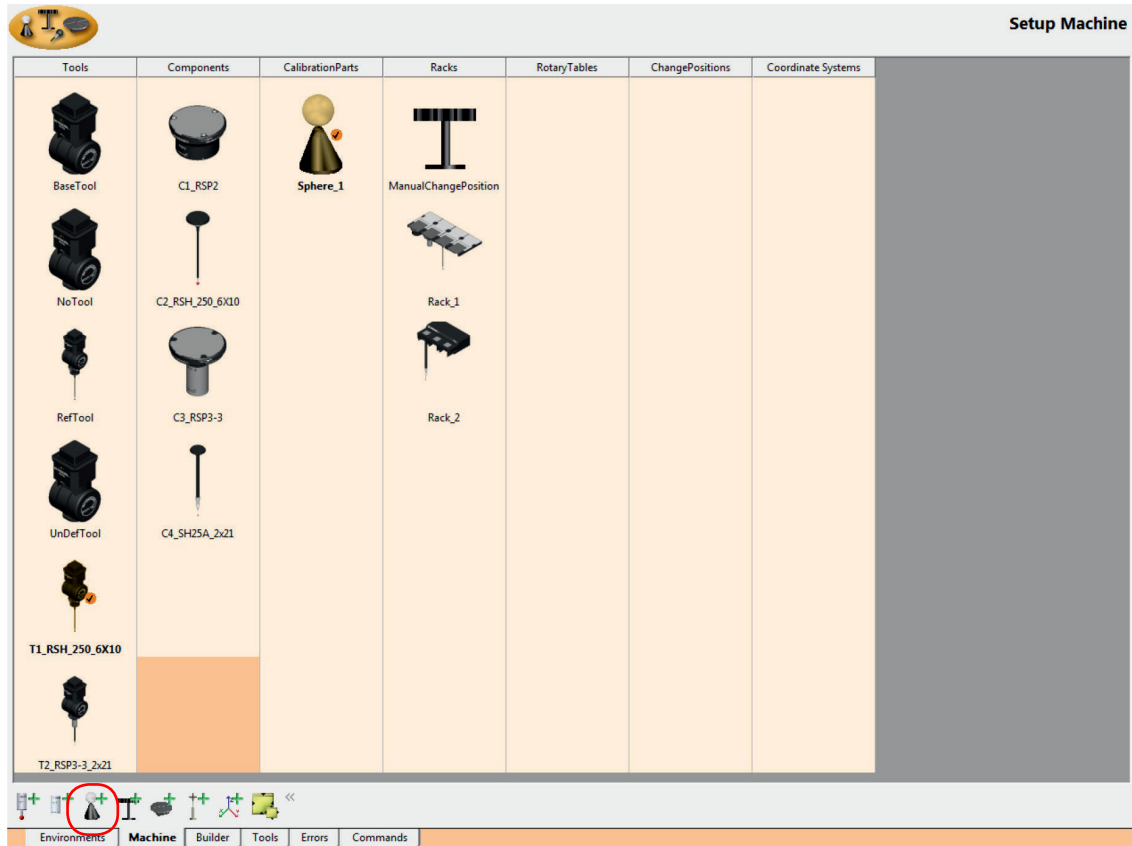
Point	X	Y	Z	I	J	K	Type
1	-120.000000	236.000000	0.000000	-0.000000	-0.000000	1.000000	Touch
2	-120.000000	269.000000	0.000000	-0.000000	-0.000000	1.000000	Touch
3	-476.000000	269.000000	0.000000	-0.000000	-0.000000	1.000000	Touch
4	-476.000000	275.000000	-5.000000	-0.000000	1.000000	-0.000000	Touch
5	-120.000000	275.000000	-5.000000	-0.000000	1.000000	-0.000000	Touch
6	-120.500000	270.000000	-5.000000	-1.000000	-0.000000	-0.000000	Touch
7	-190.500000	269.139000	-5.640000	1.000000	-0.000000	-0.000000	Touch

Environments Machine Builder Tools Errors Commands **Location**

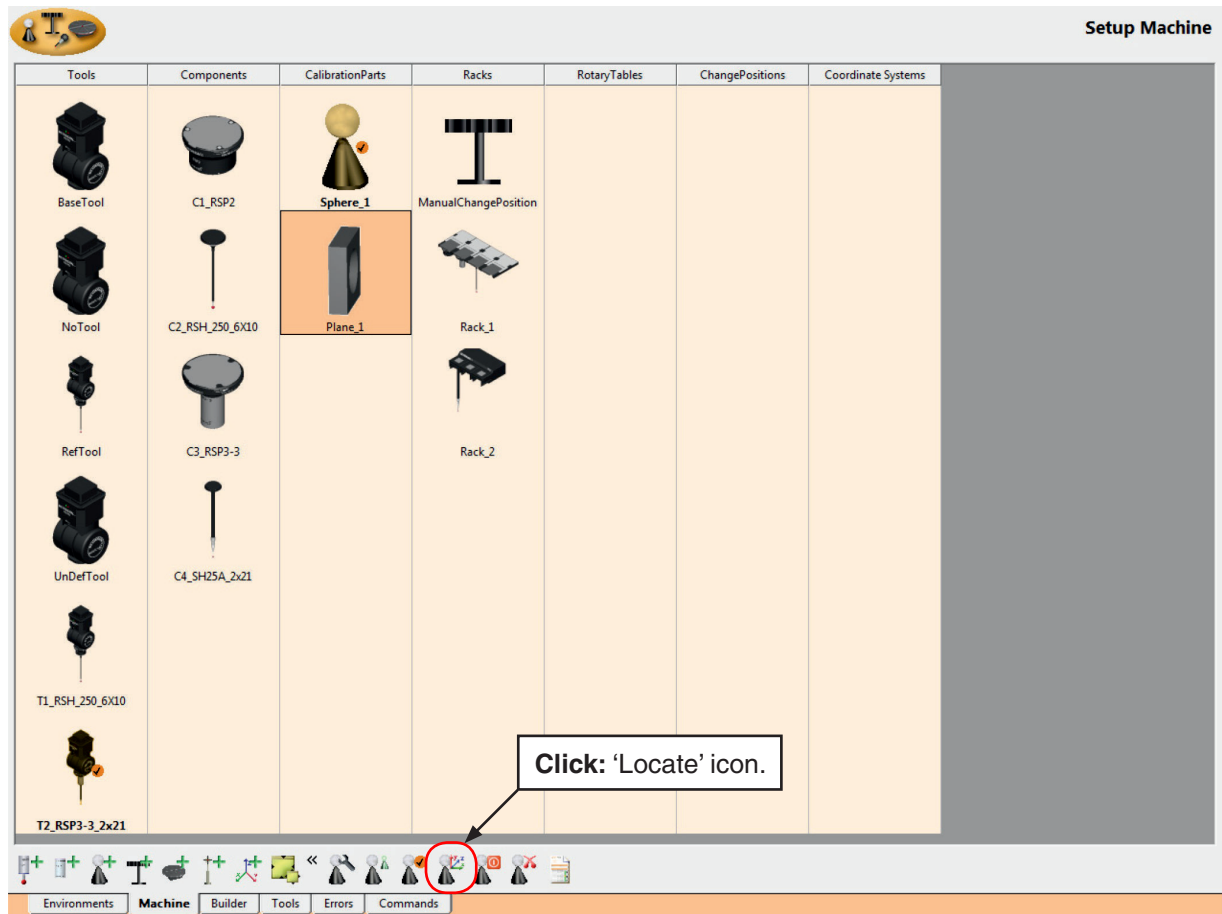
5 Adding a tip correct plane

Next we need to calibrate the 'Tip Correct Plane', where fitted.

On the 'Machine' tab click on the 'Add Calibration Part' icon:

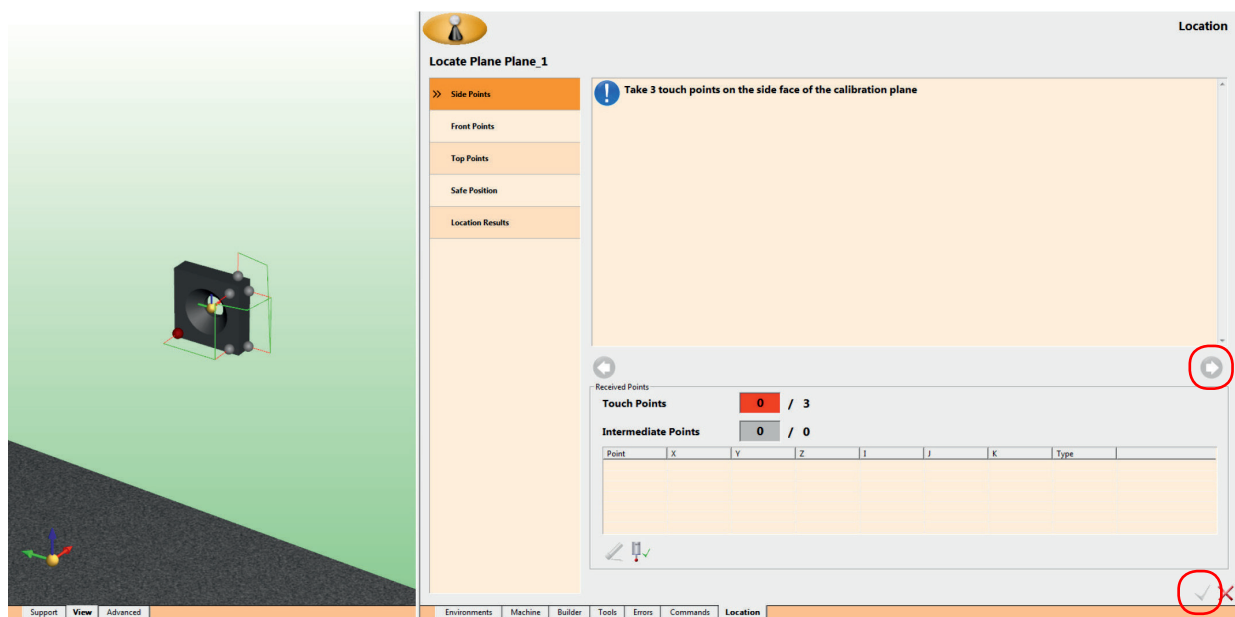


Next we need to locate the plane.



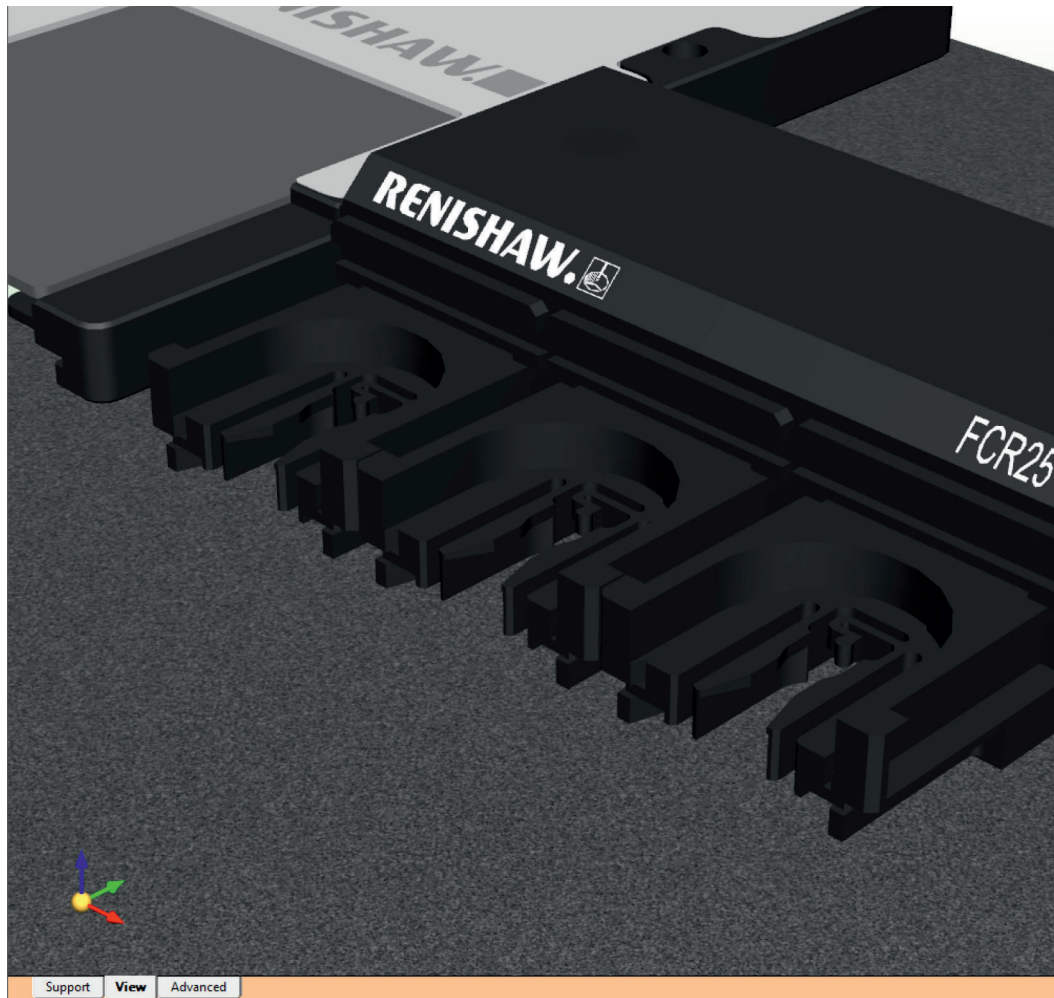
Follow the on screen instructions and illustrations for manual alignment of the plane.

Click the 'Next' arrow or 'Green Tick' as directed.

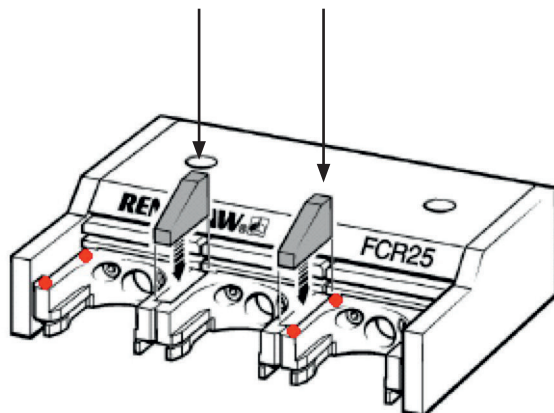


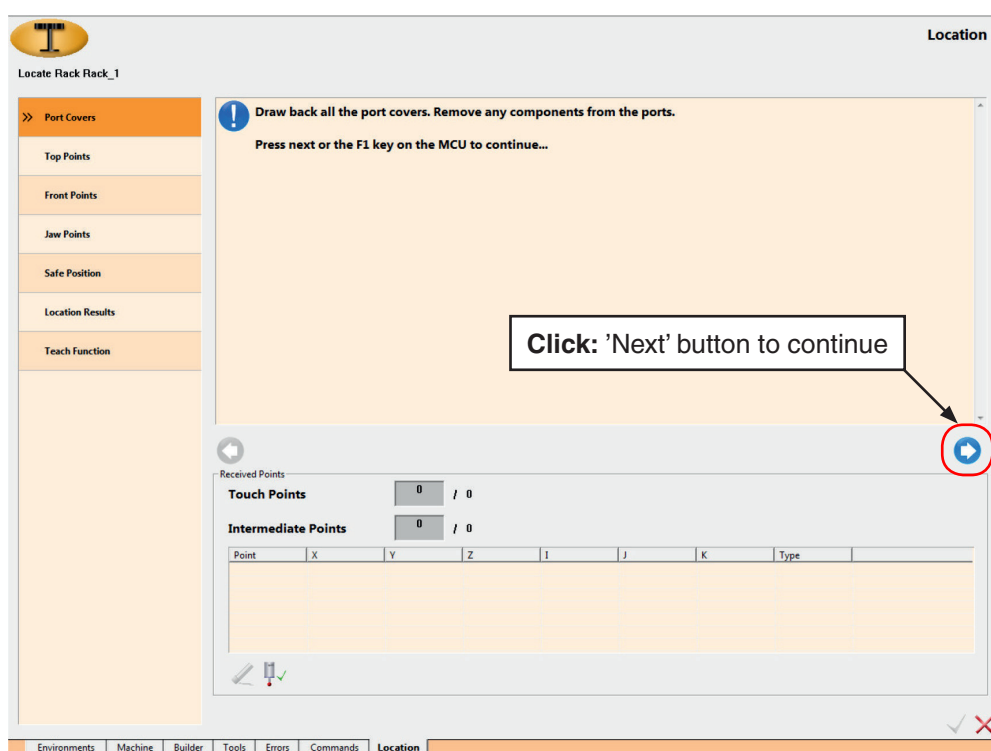
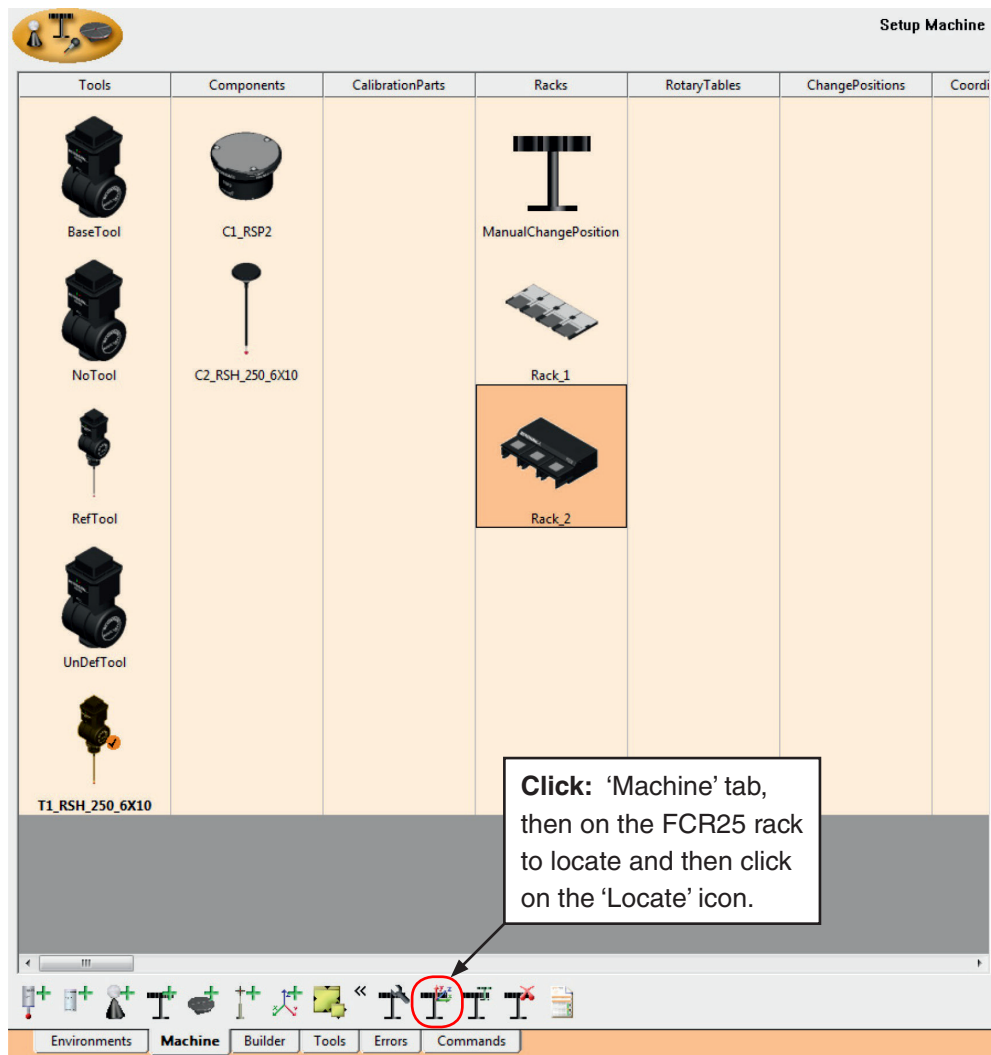
6 FCR25 rack alignment

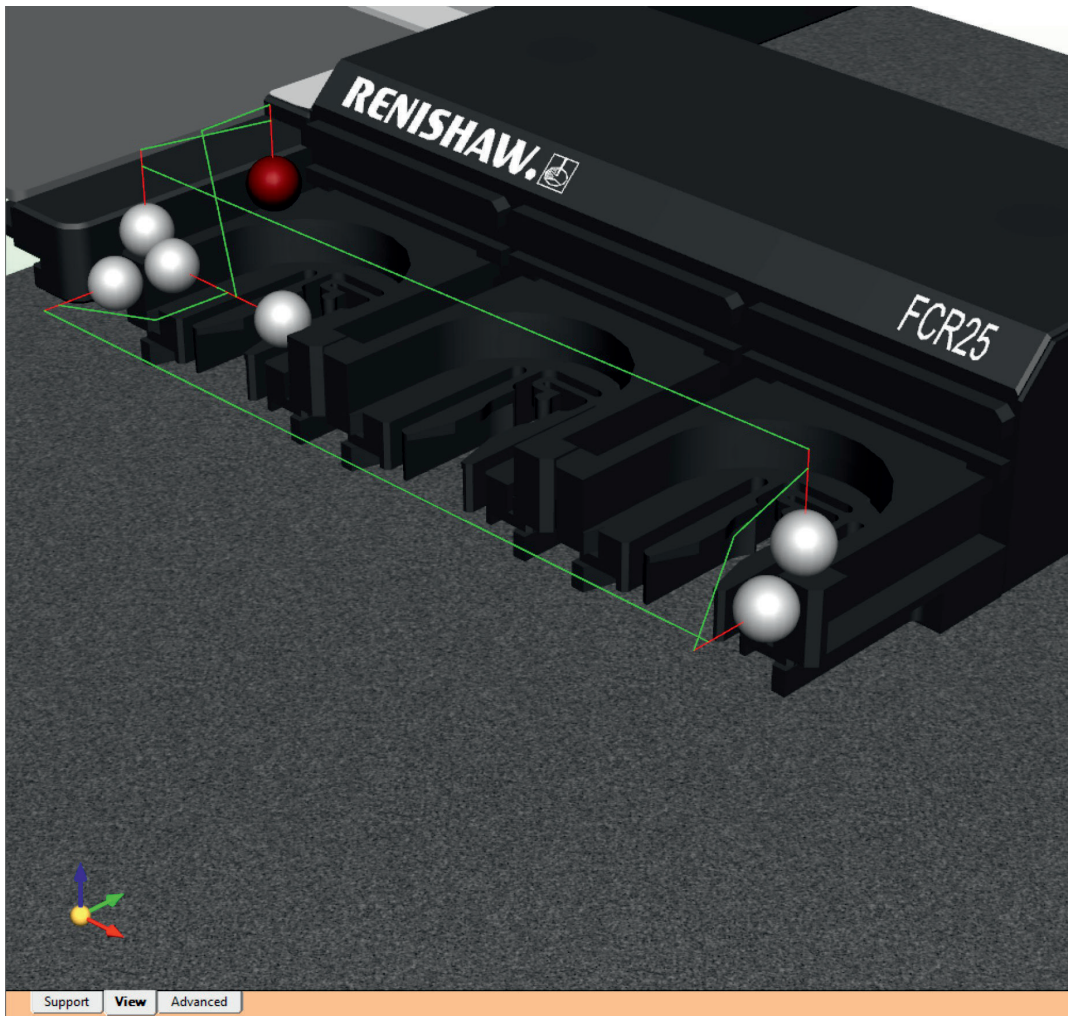
We will now cover the alignment of a FCR25 rack which is with fitted PA25-SH inserts.



Lock port covers in the open position, using wedge inserts, prior to commencing procedure.







Take points on the rack in the positions indicated on the screen by a flashing red sphere. Continue to follow the on screen instructions.

Once the manual locate procedure has been completed the following results screen will be displayed.

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Name	Rack_2
Version	UCServer 45000
Located With	TL_RSH_250_6X10.1.10.6.A0.0-80.0
Timestamp	08/02/2013 11:14:35

Location Information

Location	X=-15.000000 Y=-28.000000 Z=-3.000000
Front Direction	I=0.000000 J=1.000000 K=0.000000
Up Direction	I=0.000000 J=0.000000 K=1.000000
Safe Position	X=100.000000 Y=125.000000 Z=300.000000

Previous Location

Location	X=-15.000000 Y=-28.000000 Z=-3.000000
Front Direction	I=0.000000 J=1.000000 K=0.000000
Up Direction	I=0.000000 J=0.000000 K=1.000000
Safe Position	X=100.000000 Y=125.000000 Z=300.000000

Location Information - Copyright©2011 Metrology Software Products Ltd. All rights reserved.

Location Results

Locate Rack Rack_2

Port Covers

Top Points

Front Points

Jaw Points

Safe Position

Location Results

Teach Function

Location calculated successfully.

Press next or the F1 key on the MCU to continue...

Click: 'Next' button to continue

Received Points

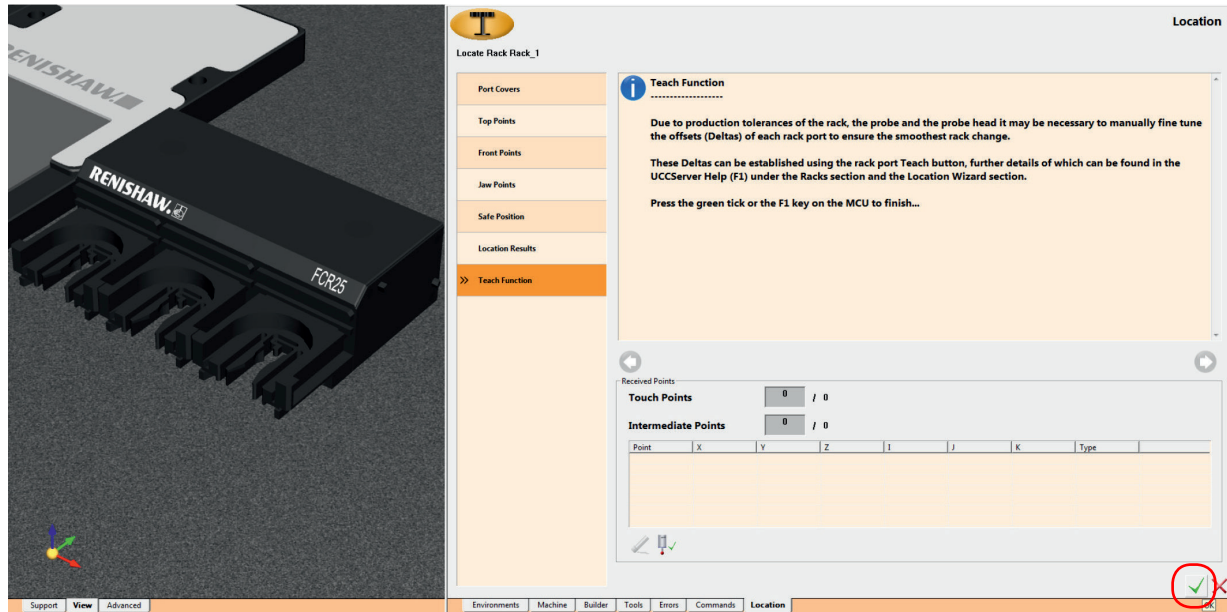
Touch Points 0 / 0

Intermediate Points 0 / 0

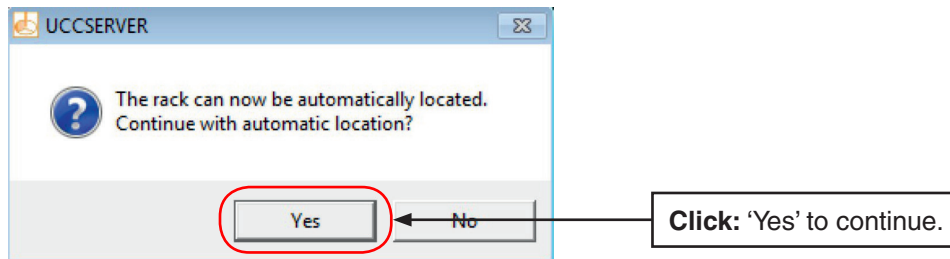
Point	X	Y	Z	I	J	K	Type

When the next screen is displayed click the 'Green Tick' to finish the procedure.

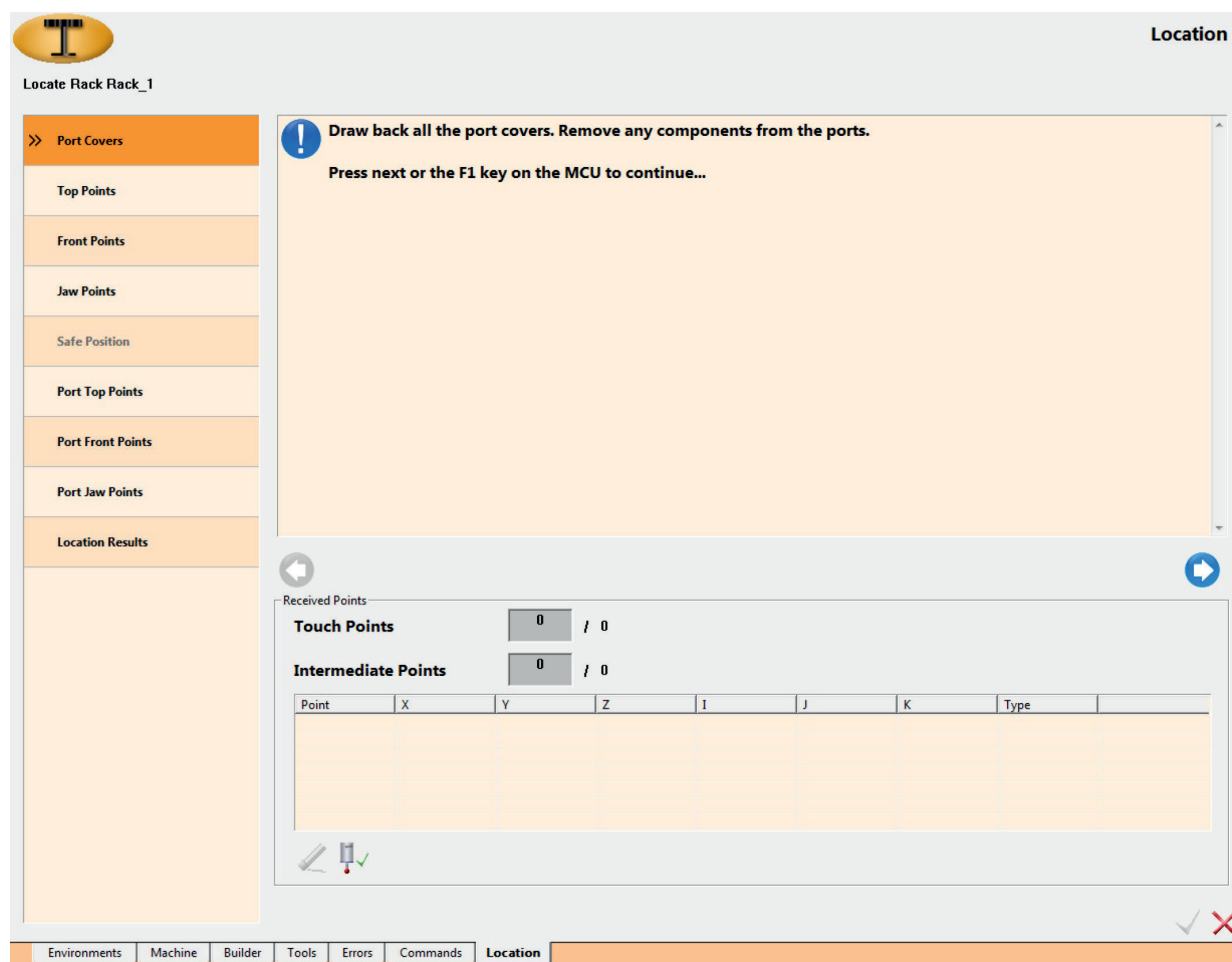
If further information is required about rack 'Delta' values please refer to UCCserver help (F1).



The following box will now be displayed asking if automatic location should be carried out. This option should always be selected - Click 'Yes' to continue.

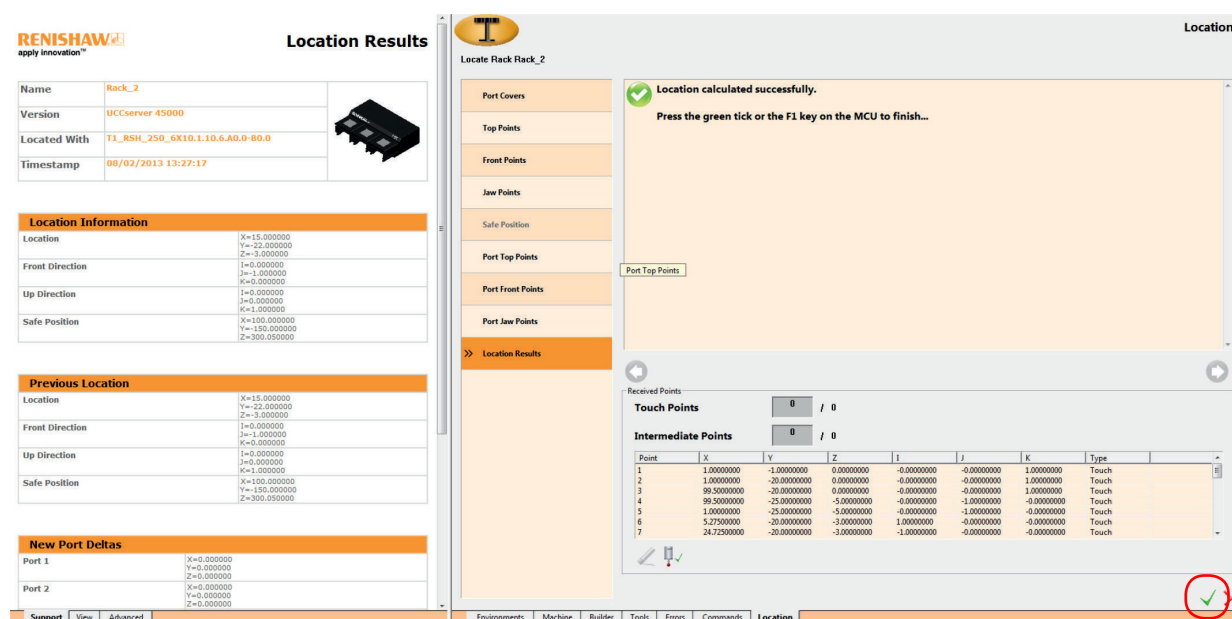


When the screen below is displayed click the 'Next' button to continue. Follow the on screen instructions to carry out automatic alignment of the rack.



Once the automatic locate procedure has been completed the following results screen will be displayed.

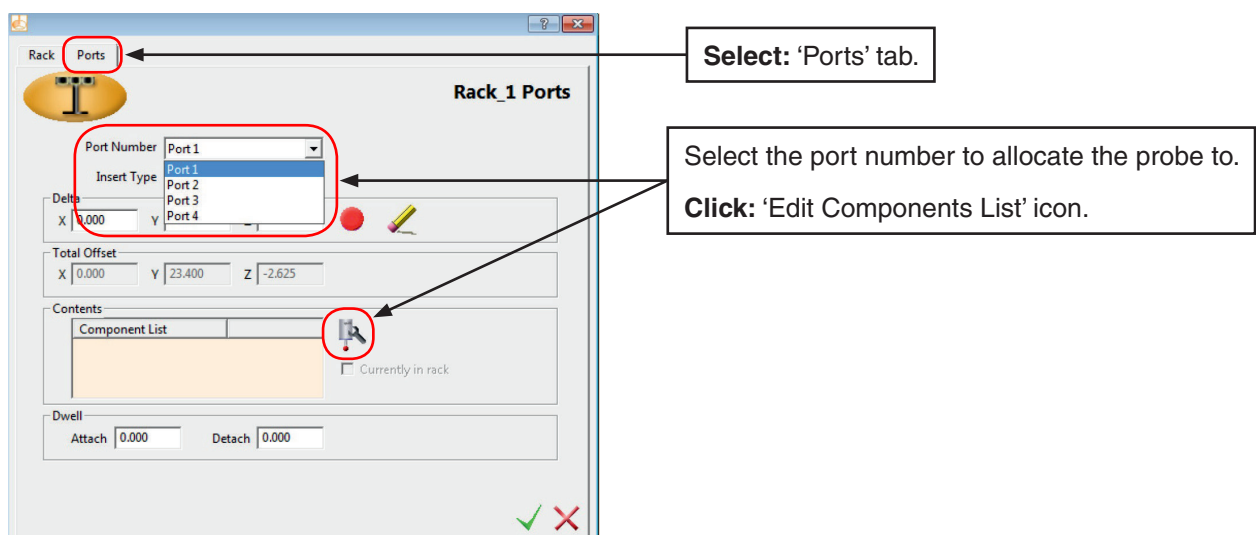
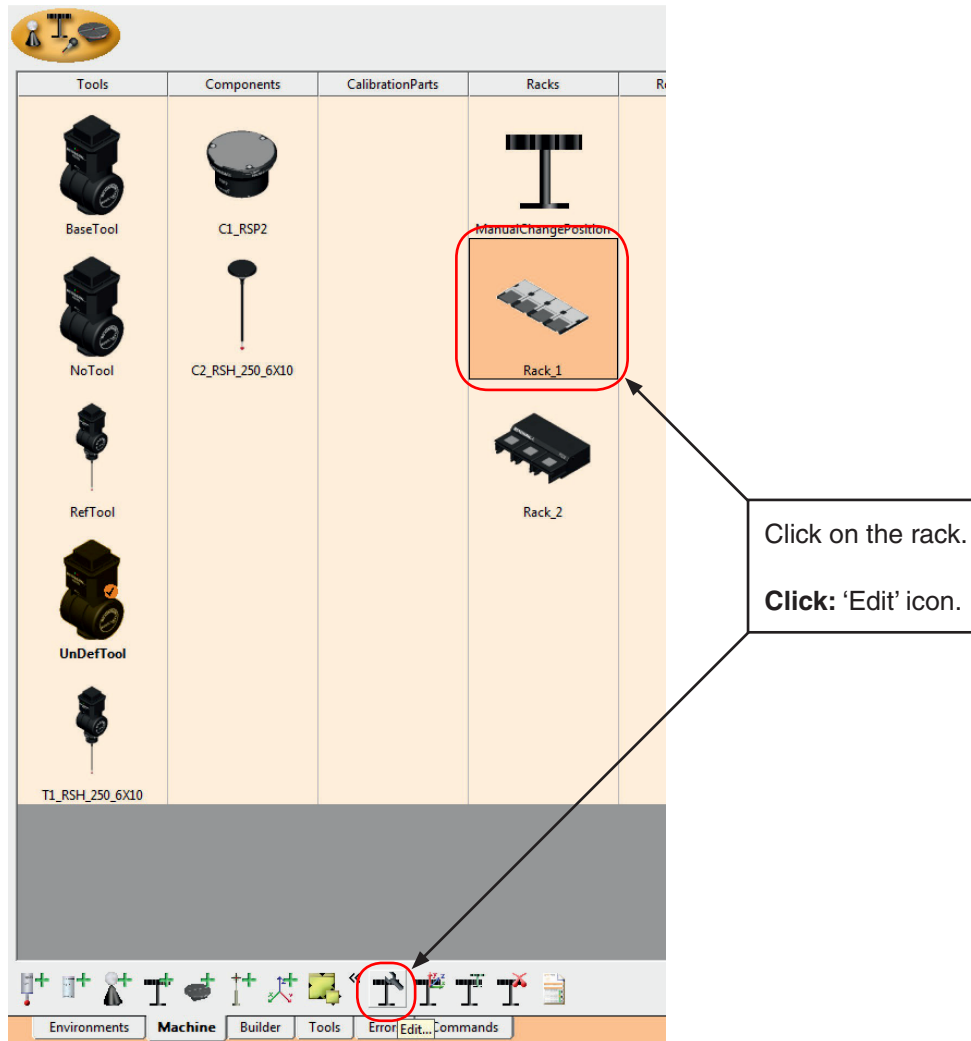
Click the 'Green Tick' to complete the procedure.

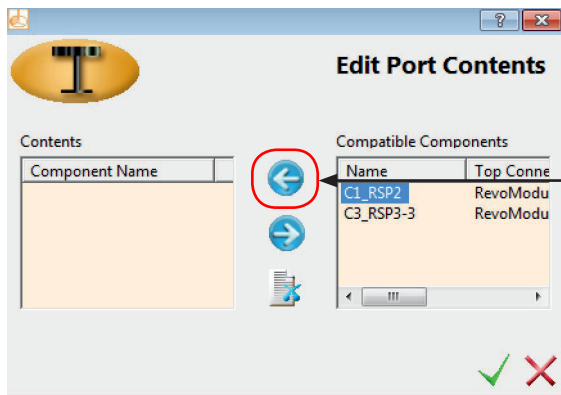


7 Allocate tool components to the racks

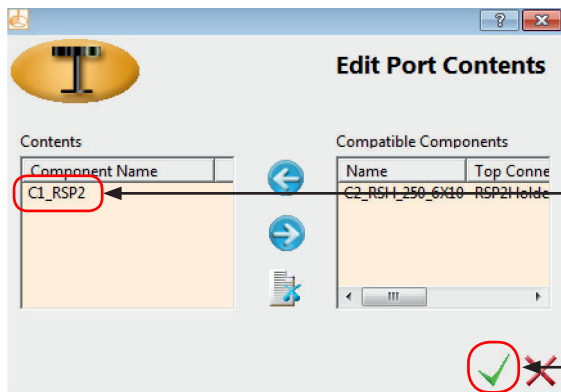
Having completed the addition and location of the two types of racks, we now need to allocate the components to those racks.

Starting with the REVO rack:





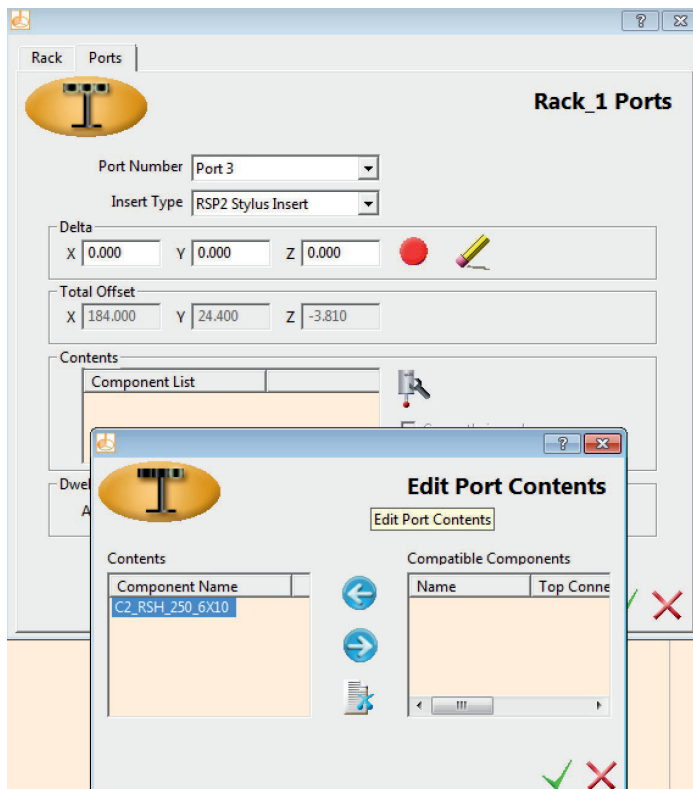
Select the component from the list to allocate to the rack, then click the 'Add Part To The Port' arrow.



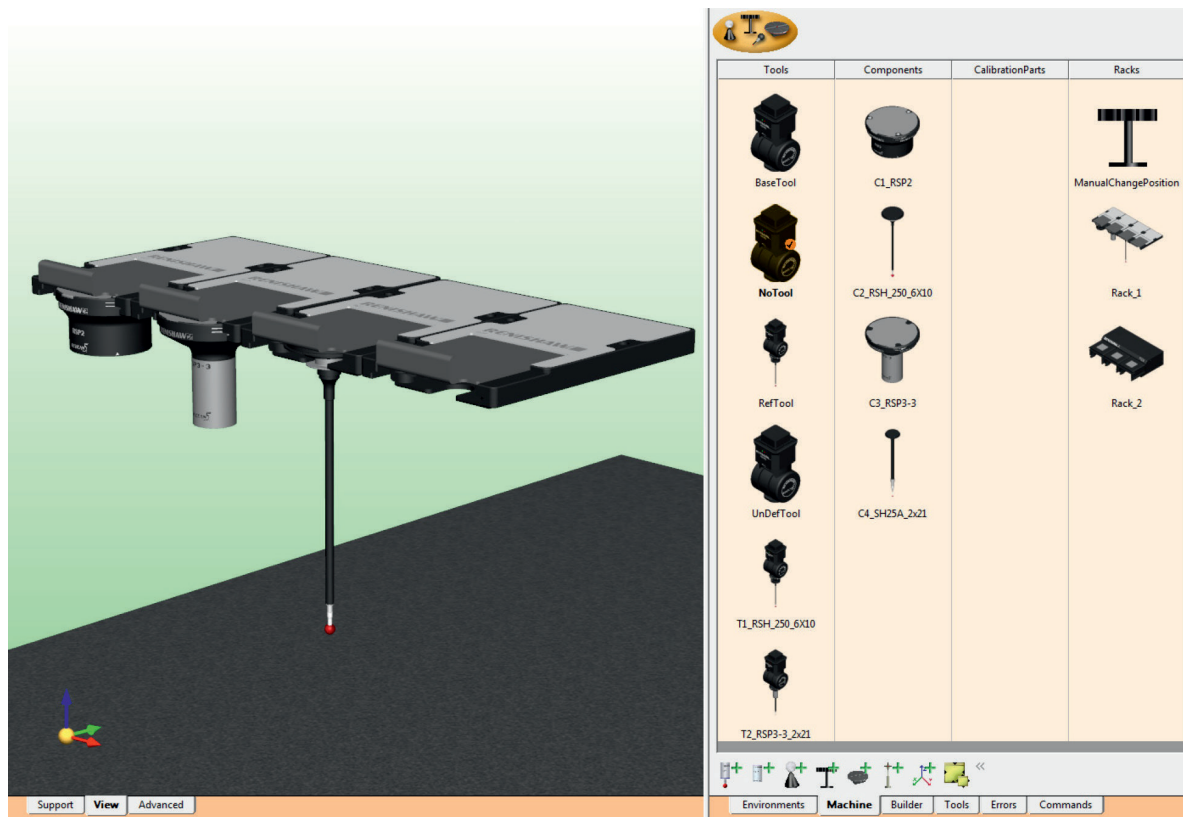
The component selected now moves to the 'Contents' box.

Click: 'GREEN TICK' to continue.

Only components suitable for the ports selected will be displayed in the 'Compatible Components' box. The screen shots above show components only suitable for ports one and two of the selected rack. Below, the screen shots show components only suitable for ports three and four.

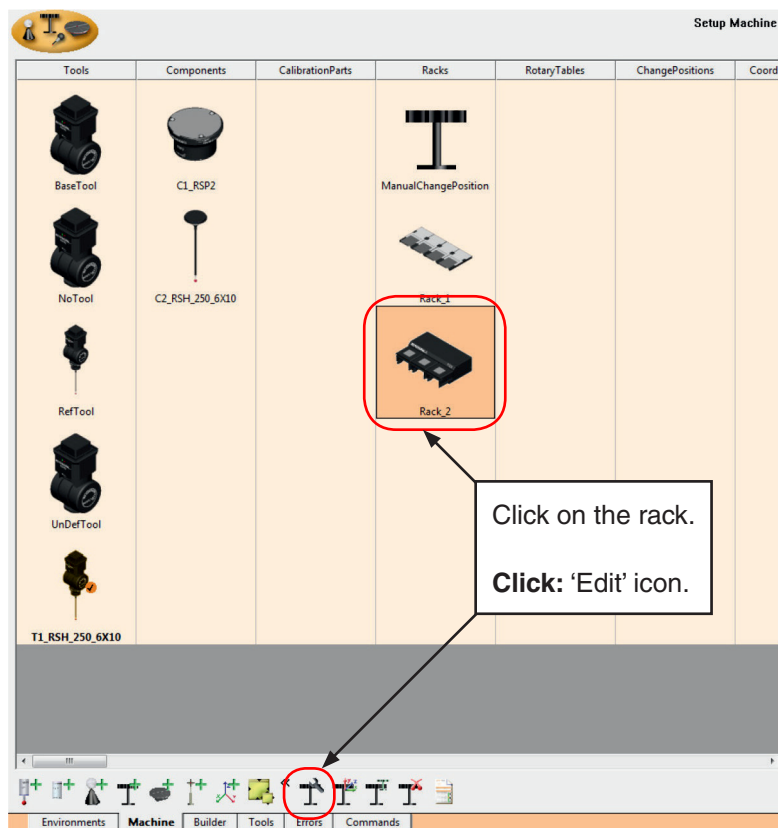


The above procedure should be repeated until all components required are allocated to the REVO rack ports.

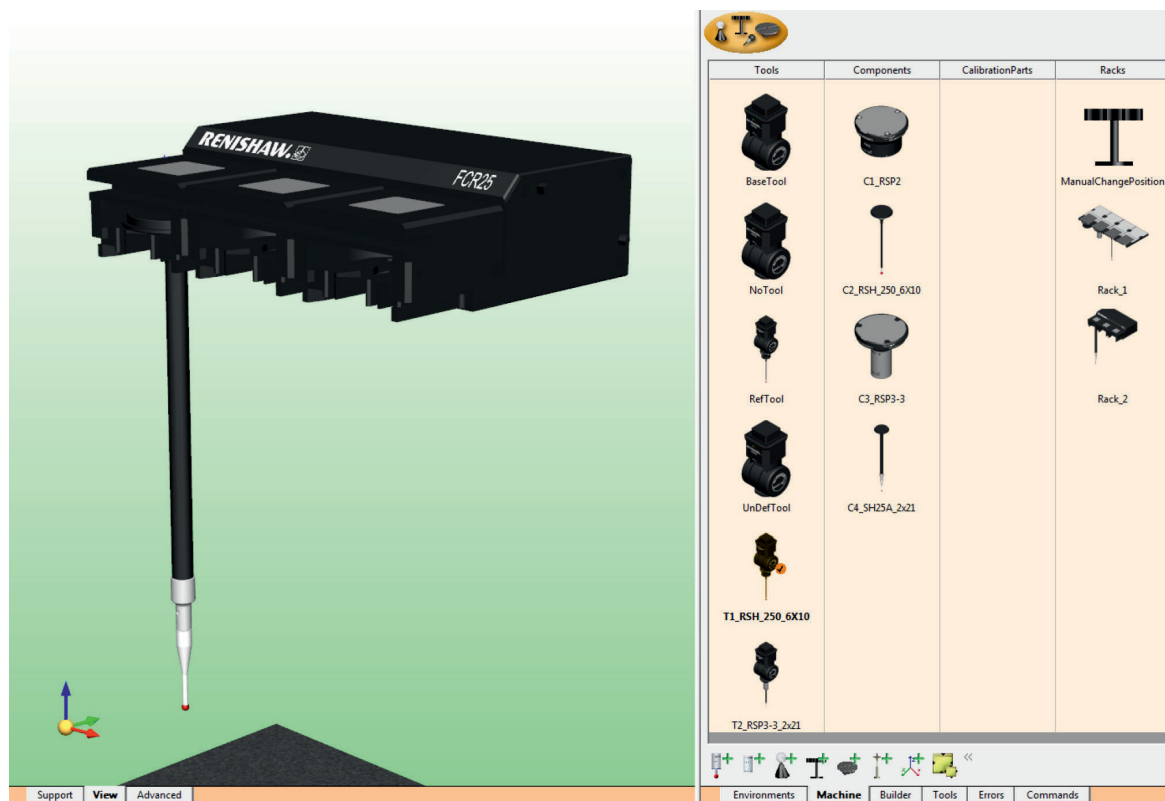
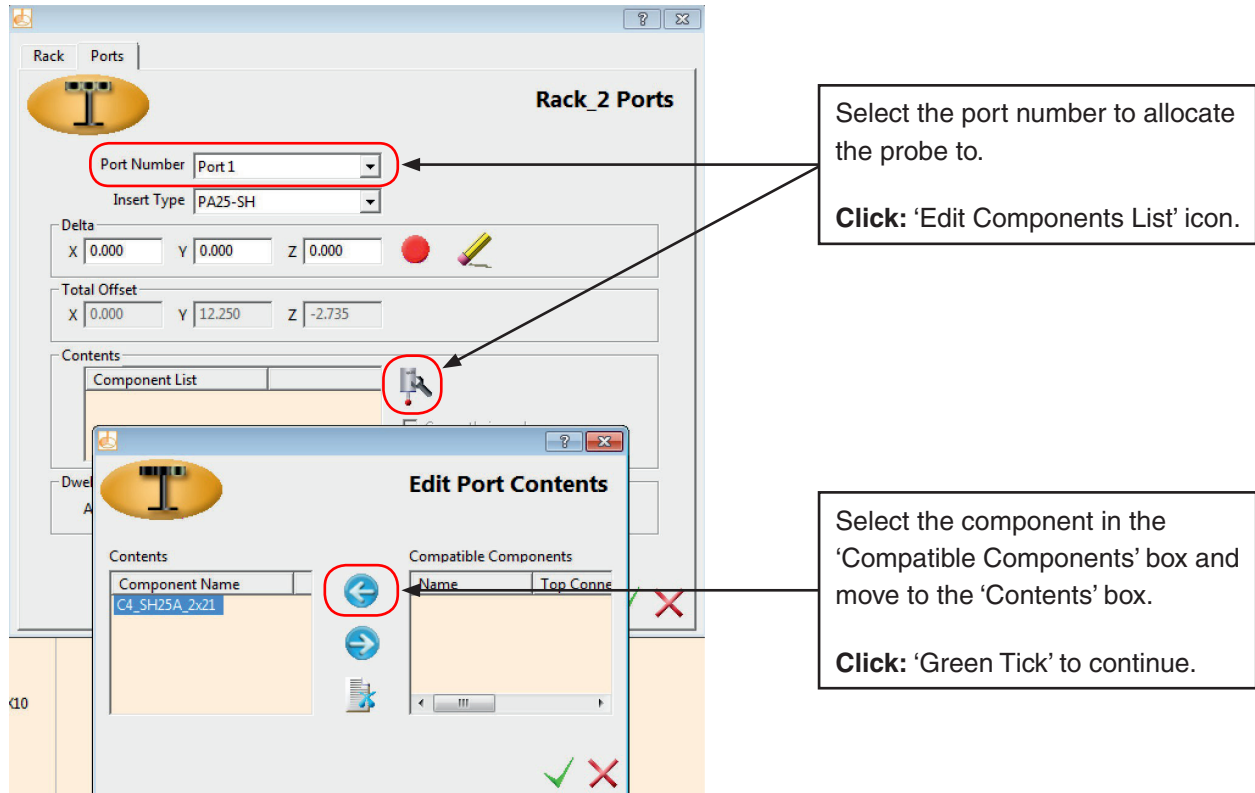


Having completed the allocation of components to the REVO rack, the above screen shot shows a pictorial representation of what has been achieved.

Exactly the same procedure should be followed to allocate components to the FCR25 rack as described for the REVO rack and shown pictorially below.

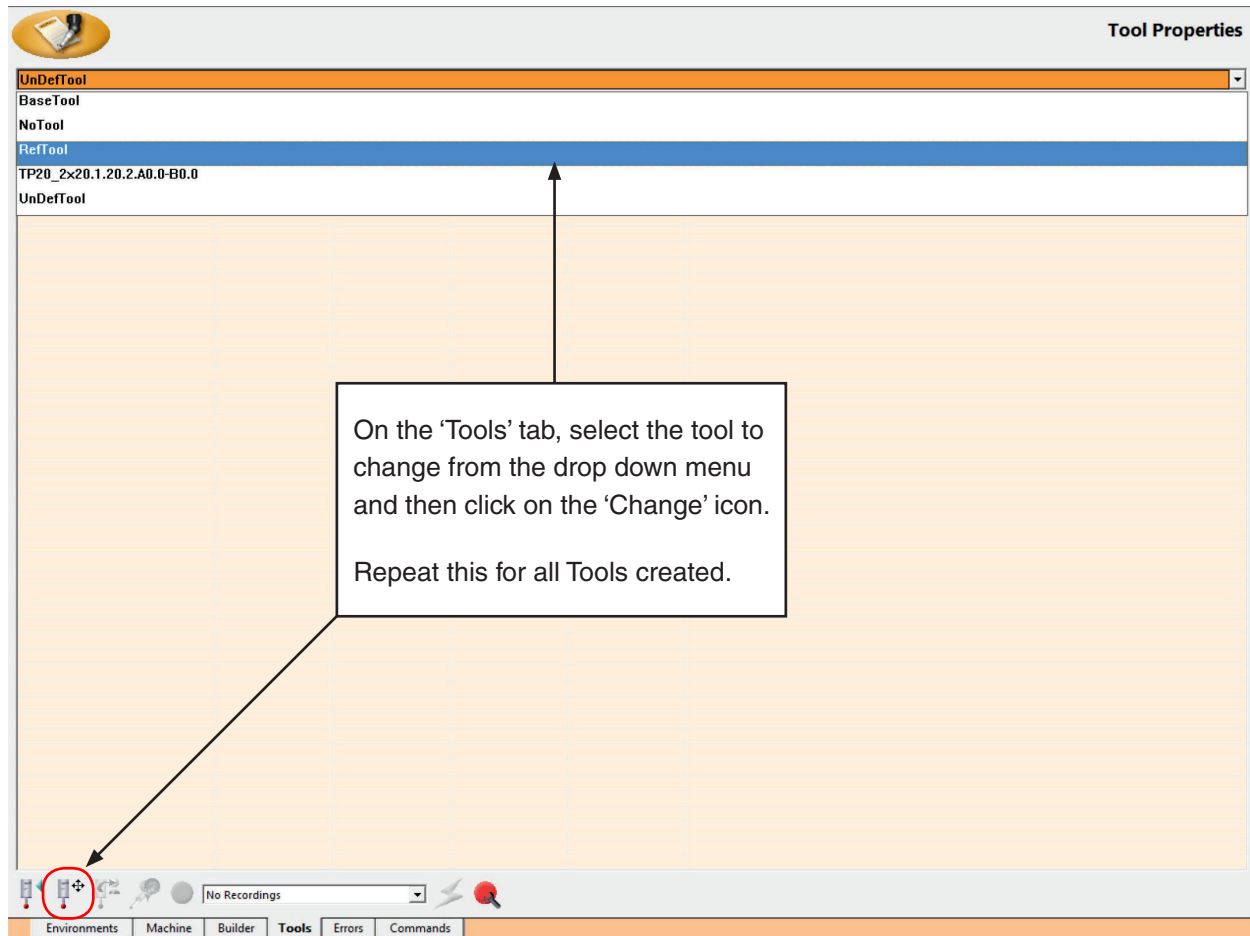


As with the REVO rack, before we allocate components to the rack we need to set up each of the ports. As shown in the screen shots below each port in this rack should have 'PA25-SH' selected in the 'Insert Type':



Having completed the allocation of components to the FCR25 rack, the above screen shot shows a pictorial representation of what has been achieved.

At this stage each tool created should be selected and changed to ensure all tool changes are carried out correctly and the rack alignment has been successful. If for any reason tool changes are not smooth or any mis-alignment is observed the rack 'DELTA' values can be modified to correct the error. Information on 'DELTA' values can be obtained from the UCCserver help files (F1).



NOTE: Tool racks have their own co-ordinate system which is independent of the machine co-ordinate system. The X axis always run along the length of the rack as indicated in the picture on page one. This is an important point to consider especially when modifying 'Delta' values which are covered in the UCCserver help files (F1).

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